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SPECTROSCOPIC OBSERVATIONS OF RS CANUM VENATICORUM

Spectroscopic observations of this Algol variable of late type were begun in 1921 soon after the publication[1] of the photometric orbit based on the observations of Maggini. It was immediately found that the observations did not fit the elements, but it was not until this year, when Mr. Sitterly kindly communicated new elements based upon his own observations, that the trouble was cleared up satisfactorily.

A preliminary study of the plates thus far secured indicates that this is one of the most interesting variables of its kind. The spectra of both components appear on the plates taken at maximum, the F3 spectrum being stronger than the other, which is of much later type. A rough solution using Sitterly's elements, Min = 2422811.666 (G. M. T.) + 4.797851 days, gives:

$$e = 0$$
$$\gamma = -9 \text{ km}$$
$$K = K_1 = 86 \text{ km}$$
$$a \sin i = a_1 \sin i = 5{,}700{,}000 \text{ km}$$
$$m \sin {}^{3}i = m_1 \sin {}^{3}i = 1.3\odot$$

The eclipse at principal minimum when the magnitude is about 9.0 seems to be total and of two or three hours' duration so that the spectrum of the fainter component shows during totality. Mr. Adams secured the first plate taken at primary minimum on February 3, 1922, and two others have been taken at the minima of May 10 and July 2. None of the three plates is entirely satisfactory as they were taken under poor atmospheric conditions, but they show that the fainter star is of the type K0 and probably belongs to the dwarf division. The length of totality would indicate that the fainter star is considerably larger in size and hence of lower density, which would lead us to expect a giant rather than a dwarf. A revision of the photometric orbit is awaited with much interest.

From its spectrum the absolute magnitude of the brighter star is estimated to be +2.8, corresponding to a parallax of 0″.008. This then is a case of a binary star whose components have nearly equal masses of the same order as that of the Sun, but which in the course of time have reached quite different conditions of temperature, surface brightness, and density.

A. H. JOY.

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[1] Sitterly, *Astrophys. Jour.*, **53**, 99, 1921.